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Terms	Documents
18 and 16 and 14	0

Database:

[US Patents Full-Text Database](#)
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[Derwent World Patents Index](#)
[IBM Technical Disclosure Bulletins](#)

Refine Search:

18 and 16

[Clear](#)**Search History****Today's Date: 8/28/2000**

<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT	18 and 16 and 14	0	L9
USPT	ink tank container	14	L8
USPT	ink jet ink tank container	0	L7
USPT	(polyethylene or polypropylene or ethylene propylene copolymer or polymethyl pentene) and ink absorbing material	69	L6
USPT	(polyethylene or polypropylene or ethylene propylene copolymer or polymethyl pentene) and ink absorbing memeber	0	L5
USPT	fibrous material	21468	L4
USPT	(5509140 or 5567373 or 5619239 or 5742311 or 5784088 or 5815184)[pn]	6	L3
DWPI	(5509140 or 5567373 or 5619239 or 5742311 or 5784088 or 5815184)[pn]	5	L2
DWPI	(5509140 or 5567373 or 5619239 or 5742311 or 5784088 or 5815184)[pn]	5	L1

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Search Results - Record(s) 1 through 6 of 6 returned.☐ 1. Document ID: US 5742311 A Relevance Rank: 52

L3: Entry 3 of 6

File: USPT

Apr 21, 1998

US-PAT-NO: 5742311

DOCUMENT-IDENTIFIER: US 5742311 A

TITLE: Replaceable ink cartridge

DATE-ISSUED: April 21, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Koitabashi; Noribumi	Yokohama	N/A	N/A	JPX
Ikeda; Masami	Yokohama	N/A	N/A	JPX
Sugama; Sadayuki	Tsukuba	N/A	N/A	JPX
Asai; Naohito	Yokohama	N/A	N/A	JPX
Hirabayashi; Hiromitsu	Yokohama	N/A	N/A	JPX
Abe; Tsutomu	Isehara	N/A	N/A	JPX
Sato; Hiroshi	Yokohama	N/A	N/A	JPX
Nagoshi; Shigeyasu	Kawasaki	N/A	N/A	JPX
Shimizu; Eiichiro	Urawa	N/A	N/A	JPX
Higuma; Masahiko	Tohgane	N/A	N/A	JPX
Akiyama; Yuji	Yokohama	N/A	N/A	JPX
Sugimoto; Hitoshi	Kawasaki	N/A	N/A	JPX
Matsubara; Miyuki	Tokyo	N/A	N/A	JPX
Sato; Shinichi	Kawasaki	N/A	N/A	JPX
Gotoh; Fumihiro	Yokohama	N/A	N/A	JPX
Uetsuki; Masaya	Kawasaki	N/A	N/A	JPX

US-CL-CURRENT: 347/86; 347/100

ABSTRACT:

A replaceable ink cartridge, usable with a bubble jet printer, includes a container having front, back, top bottom and side walls, the container being divided internally into a first chamber and a second chamber having a common partition extending downward perpendicularly toward the bottom wall to provide an opening between the chambers formed by the partition proximate to the bottom wall. The first chamber contains a reservoir of liquid ink and is generally sealed from ambient air except through the opening, and the second chamber has an air vent for admitting ambient air into the second chamber and an ink supply outlet in the front wall. The second chamber contains a sponge-like material for retaining ink, at least one groove in the second chamber side of the partition extending from the opening and terminating at a point partly up the partition to form an air flow passage from the second chamber to the first chamber, the sponge-like material being positioned in the second chamber to permit flow of air from the air vent to the groove when the level of retained ink in the sponge-like material is proximate to the point where the groove

terminates. The container is removably mountable in a printer mounting with the bottom wall facing downward and the ink supply outlet facing an ink jet print head so that the ink supply outlet is connectable to an ink port of the ink jet print head.

42 Claims, 85 Drawing figures Exemplary Claim Number: 1,15,29
Number of Drawing Sheets: 45

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
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☐ 2. Document ID: US 5509140 A Relevance Rank: 48

L3: Entry 6 of 6

File: USPT

Apr 16, 1996

US-PAT-NO: 5509140

DOCUMENT-IDENTIFIER: US 5509140 A

TITLE: Replaceable ink cartridge

DATE-ISSUED: April 16, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Koitabashi; Noribumi	Yokohama	N/A	N/A	JPX
Ikeda; Masami	Yokohama	N/A	N/A	JPX
Sugama; Sadayuki	Tsukuba	N/A	N/A	JPX
Asai; Naohito	Yokohama	N/A	N/A	JPX
Hirabayashi; Hiromitsu	Yokohama	N/A	N/A	JPX
Abe; Tsutomu	Isehara	N/A	N/A	JPX
Sato; Hiroshi	Yokohama	N/A	N/A	JPX
Nagoshi; Shigeyasu	Kawasaki	N/A	N/A	JPX
Shimizu; Eiichiro	Urawa	N/A	N/A	JPX
Higuma; Masahiko	Tohgane	N/A	N/A	JPX
Akiyama; Yuji	Yokohama	N/A	N/A	JPX
Sugimoto; Hitoshi	Kawasaki	N/A	N/A	JPX
Matsubara; Miyuki	Tokyo	N/A	N/A	JPX
Sato; Shinichi	Kawasaki	N/A	N/A	JPX
Gotoh; Fumihiko	Yokohama	N/A	N/A	JPX
Uetsuki; Masaya	Kawasaki	N/A	N/A	JPX

US-CL-CURRENT: 347/86; 347/100, 347/87, D18/56

ABSTRACT:

A replaceable ink cartridge, usable with a bubble jet printer, comprises a container formed by front, back, top and bottom walls, and two side walls providing major surfaces of said container, with a partition dividing the container into first and second chambers communicating with each other through an opening formed by the partition proximate to the bottom wall. The first chamber, which is generally sealed from ambient air except through the opening, contains a reservoir of liquid ink, and the second chamber contains a sponge-like material for producing a negative pressure whereby ink is deliverable from the first chamber through the opening to an ink supply outlet in the front wall proximate to the bottom wall. The partition has at least one groove for forming an air flow passage from the second chamber to the first chamber through the opening, thereby permitting introduction of air into the

chamber through the opening, thereby permitting introduction of air into the first chamber and flow of liquid ink to the ink supply outlet through the opening. The container is removably mountable in a printer mounting with the bottom wall facing downward and the front wall facing an ink jet print head so that the ink supply outlet is connectable to an ink port of the print head.

14 Claims, 88 Drawing figures Exemplary Claim Number: 1
Number of Drawing Sheets: 45

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
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☐ 3. Document ID: US 5567373 A Relevance Rank: 48

L3: Entry 5 of 6

File: USPT

Oct 22, 1996

US-PAT-NO: 5567373

DOCUMENT-IDENTIFIER: US 5567373 A

TITLE: Method and apparatus for manufacturing a liquid container having plural porous members

DATE-ISSUED: October 22, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sato; Osamu	Kawasaki	N/A	N/A	JPX
Sugitani; Hiroshi	Tokyo	N/A	N/A	JPX
Orikasa; Tsuyoshi	Tokyo	N/A	N/A	JPX
Ujita; Toshihiko	Yamato	N/A	N/A	JPX
Higuma; Masahiko	Togane	N/A	N/A	JPX
Kotaki; Yasuo	Tokyo	N/A	N/A	JPX
Hinami; Jun	Kawasaki	N/A	N/A	JPX

US-CL-CURRENT: 264/112; 264/120, 347/86, 347/87, 425/406

ABSTRACT:

The invention provides a method and apparatus for manufacturing a liquid container having an enclosed space within an inner wall of the liquid container, the enclosed space filled with a plurality of porous members. The plurality of porous members include a plurality of inner porous members and a plurality of outer porous members. The method includes the step of packing the porous members into the enclosed space so that the inner porous members only contact and press against other inner porous members and/or outer porous members, and the outer porous members contact and press against the inner porous members and the inner wall of the liquid container. The method also comprises a step of compressing the porous members. The apparatus has compressing means for compressing the porous members and packing means for packing the porous members into the liquid container. The invention aims to reduce an amount of non-dischargeable liquid contained by the liquid container by packing porous members into the liquid container with a desired compression distribution. The invention also aims to allow the same kind of porous members to be suitably packed into containers that store liquids having different surface tensions, or containers having different capacities or shapes.

30 Claims, 26 Drawing figures Exemplary Claim Number: 1
Number of Drawing Sheets: 13

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KMMC	Draw Desc	Image
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☐ 4. Document ID: US 5619239 A Relevance Rank: 48

L3: Entry 4 of 6

File: USPT

Apr 8, 1997

US-PAT-NO: 5619239

DOCUMENT-IDENTIFIER: US 5619239 A

TITLE: Replaceable ink tank

DATE-ISSUED: April 8, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kotaki; Yasuo	Machida	N/A	N/A	JPX
Takenouchi; Masanori	Yokohama	N/A	N/A	JPX
Saikawa; Hideo	Machida	N/A	N/A	JPX
Nozawa; Minoru	Yokohama	N/A	N/A	JPX
Sato; Osamu	Kawasaki	N/A	N/A	JPX
Ujita; Toshihiko	Yamato	N/A	N/A	JPX
Miyagawa; Masashi	Yokohama	N/A	N/A	JPX
Yamamoto; Hisashi	Machida	N/A	N/A	JPX
Hamasaki; Yuji	Sagamihara	N/A	N/A	JPX
Hinami; Jun	Kawasaki	N/A	N/A	JPX

US-CL-CURRENT: 347/86

ABSTRACT:

A replaceable ink tank for an ink cartridge used in a bubble jet printer comprises a container formed by two side walls providing major surfaces of the container, and back, front, top and bottom walls. At least one ink supply port is provided in the bottom wall of container and is disposed for supplying ink from at least one ink chamber in the container to a corresponding ink tapping pipe in the ink cartridge. The container is configured for insertion into an opening in the top and front of the ink cartridge with the bottom wall of the container facing downward and a back wall facing a back wall of the ink cartridge, the container being constructed for engaging a camming shoe located at the back inside of a top wall of the cartridge and securing the container in place in the ink cartridge with the ink supply port connecting with the corresponding ink tapping pipe.

26 Claims, 46 Drawing figures Exemplary Claim Number: 1

Number of Drawing Sheets: 18

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KMMC	Draw Desc	Image
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☐ 5. Document ID: US 5784088 A Relevance Rank: 48

L3: Entry 2 of 6

File: USPT

Jul 21, 1998

US-PAT-NO: 5784088

DOCUMENT-IDENTIFIER: US 5784088 A

TITLE: Ink jet recording apparatus using recording unit with ink cartridge having ink inducing element

DATE-ISSUED: July 21, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ujita; Toshihiko	Yamato	N/A	N/A	JPX
Takenouchi; Masanori	Yokohama	N/A	N/A	JPX
Tsukuda; Keiichiro	Kawasaki	N/A	N/A	JPX

US-CL-CURRENT: 347/86; 347/87, 347/93

ABSTRACT:

An ink cartridge (3) including an ink reservoir portion having a porous member (37) for storing ink and an ink supply portion (39) has an ink inducing element (47) disposed between the ink reservoir portion and the ink-supply portion (39). The ink inducing element (47) is made of bundle of fibers in which each fiber is disposed in parallel to the direction of ink supplying from the ink reservoir to the ink supply portion (39), and one end of the ink inducing element (47) is press-touched to the porous member (37).

44 Claims, 57 Drawing figures Exemplary Claim Number: 1
Number of Drawing Sheets: 24

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWC	Draw. Desc	Image
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☐ 6. Document ID: US 5815184 A Relevance Rank: 48

L3: Entry 1 of 6

File: USPT

Sep 29, 1998

US-PAT-NO: 5815184

DOCUMENT-IDENTIFIER: US 5815184 A

TITLE: Ink container having plural porous members for storing ink and ink jet apparatus having said ink container

DATE-ISSUED: September 29, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ujita; Toshihiko	Yamato	N/A	N/A	JPX
Sugitani; Hiroshi	Machida	N/A	N/A	JPX
Orikasa; Tsuyoshi	Musashimurayama	N/A	N/A	JPX
Sato; Osamu	Kawasaki	N/A	N/A	JPX
Higuma; Masahiko	Tougane	N/A	N/A	JPX
Kotaki; Yasuo	Machida	N/A	N/A	JPX
Hinami; Jun	Kawasaki	N/A	N/A	JPX

US-CL-CURRENT: 347/87

ABSTRACT:

An ink container for storing ink and an ink jet apparatus having such an ink container is provided. The ink container has an ink tank providing an enclosed space within an inner wall of the tank. The ink container is filled with inner and outer porous members having open pores for holding ink. The inner porous members are disposed within the enclosed space so as to only contact and press against other inner or outer porous members or both. The outer porous members are disposed within the enclosed space so as to contact and press against the inner porous members and the inner wall of the ink tank. This arrangement of inner and outer porous members within the ink container prevents an uneven compression distribution which occurs when conventional porous members are inserted into ink containers or when ink containers containing such conventional porous members suffer impacts. Further, the porous members can fill the entire ink container regardless of the shape of its interior, thus reducing the amount of non-dischargeable ink and leakage.

19 Claims, 23 Drawing figures Exemplary Claim Number: 14
Number of Drawing Sheets: 9

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
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Terms	Documents
(5509140 or 5567373 or 5619239 or 5742311 or 5784088 or 5815184)[pn]	6

[Display](#)

50

Documents, starting with Document:

6

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